

## (12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
15 January 2004 (15.01.2004)

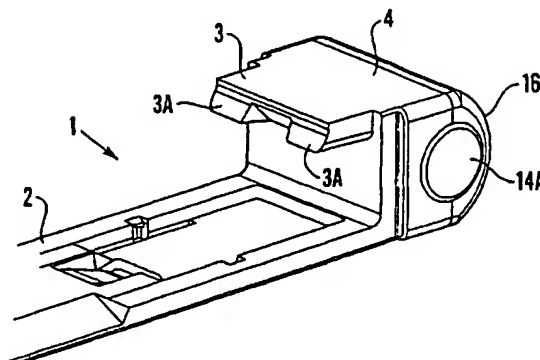
PCT

(10) International Publication Number  
**WO 2004/005654 A1**

- (51) International Patent Classification<sup>7</sup>: **E05B 73/00**
- (21) International Application Number:  
PCT/GB2003/002885
- (22) International Filing Date: 4 July 2003 (04.07.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
0215397.1 4 July 2002 (04.07.2002) GB
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- (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Declaration under Rule 4.17:**  
— of inventorship (Rule 4.17(iv)) for US only
- Published:**  
— with international search report  
— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

[Continued on next page]

(54) Title: SECURITY DEVICE



(57) Abstract: A security device (2) for attachment to a container (7,10) having external walls such that a transponder (20) thereon is located externally of or adjacent to one of said external walls so as to avoid being shielded by a metal layer (21) within the container (7, 10) (e.g. the metal layer within a disk such as a CD or DVD). The security device (2) is arranged to trigger an alarm signal if the container (7, 10) is moved within the range of an alarm unit with the security device (2) attached thereto, and has a releasable locking mechanism (11, 12) to secure it to the container (7,10) such that release of the locking mechanism (11, 12) requires the use of authorised release means. In one embodiment the transponder (20) is located in the vicinity of a window (21A) in a metal layer (21), e.g. at the centre of the disk.



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*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

## SECURITY DEVICE

### TECHNICAL FIELD

This invention relates to a security device for attachment to a container, for example to a container housing a disk such as a CD or DVD, to help in preventing or deterring its theft from a retail outlet.

### BACKGROUND ART

It is well known to use security tags on retail items which trigger an alarm when the item is taken passed alarm units located at the exit of a store without prior removal of the security tag. These are known as Electronic Article Surveillance (EAS) labels or tags. There are 3 main types of devices: electromagnetic devices, acoustic magnetic (AM) devices (which are typically in the form of a flat strip or label approximately 45mm long x 40mm wide) and Radio Frequency (RF) tags which typically comprise either a flat coil of wire approximately 50mm in diameter or a coil wound around a ferrite rod to form an antenna. The tag acts as a transponder, i.e. it is energised on receipt of radiation, e.g. from an alarm unit, and then transmits a signal back automatically, e.g. to the alarm unit. Other types of tags are also known, e.g. Radio Frequency ID (RFID) tags, also known as "intelligent tags" as they send additional information with the signal they transmit. These types of tags and transponders are well known so will not be described further.

A problem that arises with some of these devices, particularly with electromagnetic devices such as RF tags, is that they can be shielded by a metal layer, e.g. the metal layer within a CD or DVD, yet it is desirable to be able to use this form of tag as a significant proportion of retail outlets use RF alarm systems rather than AM alarm systems. Such shielding may attenuate electromagnetic signals passing therethrough and/or cause frequency shift of the signals. RF tags comprising flat coils can be used but as they are relatively large it is difficult to mount them in a position when used with a container such as a CD or DVD box where they do not suffer from shielding.

The present invention aims to provide an arrangement of a security device which helps avoid or reduce this problem.

#### SUMMARY OF INVENTION

According to a first aspect of the invention, there is provided a security device for attachment to a container having external walls such that at least a signal receiving and/or transmitting portion thereof is located externally of or adjacent to one of said external walls, the security device being arranged to trigger an alarm signal if the container is moved within the range of an alarm unit with the security device attached thereto, the security device having a releasable locking mechanism to secure it to the container such that release of the locking mechanism requires the use of authorised release means.

According to a second aspect of the invention, there is provided a security device for attachment to apparatus adapted to hold one or more articles which includes a layer which is non-transparent to electromagnetic radiation, the security device having a portion for receiving and/or transmitting electromagnetic radiation so as to trigger an alarm signal if the apparatus is moved within the range of an alarm unit with the security device attached thereto, said portion being located on the device such that it lies in the vicinity of a window in said layer or a gap between two such layers so as to be able to receive and/or transmit electromagnetic radiation through said window or gap when the device is attached to said apparatus.

Preferably, the security device is of a type such as described and claimed in WO 02/39451 with a non-planar RF transponder mounted thereon, preferably on (or within) a portion thereof which remains externally of a container to which the device is mounted. Such a security device may simply have a locking mechanism to releasably secure it within the container but preferably also serves to secure the contents of the container, e.g. a disk, to the container and/or to secure the container in a closed configuration.

The invention also relates to such a security device in combination with a container adapted to receive the device.

The invention also relates to a device arranged to receive signal receiving and/or transmitting means such that, when said signal receiving and/or transmitting means is mounted therein, a security device such as that detailed above is provided.

Other preferred and optional features of the invention will be apparent from the following description and from the subsidiary claims of the specification.

#### BRIEF DESCRIPTION OF DRAWINGS

The invention will now be further described, namely by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of part of a security device according to a first embodiment of the invention;

Figure 2 is an exploded perspective view corresponding to that shown in figure 1;

Figure 3 is an exploded perspective view from another direction of the part shown in figure 1;

Figure 4 is a plan view illustrating the use of a device as shown on Figures 1-3 with a CD or DVD container;

Figure 5 is a cross-sectional view taken along line VI – VI of Figure 4 (with the security device inserted further into the container);

Figure 6 is a plan view of a further embodiment of the invention showing the security device being installed in a DVD container (with the DVD omitted for clarity);

Figure 7 is a similar view to Figure 6 but shows the position of the security device when fully inserted into the container;

Figure 8 is a cross-sectional view taken on line A-A of Figure 7 (but also showing a disk held on the apparatus); and

Figure 9 is a similar cross-sectional view through a different kind of DVD container.

#### BEST MODE OF THE INVENTION

The embodiment of the security device illustrated in Figures 1-5 is designed for use with a CD or DVD container of the type described in WO 02/39451, the disclosure of which is incorporated herein. The security device may, however, be used with other types of container.

The security tag 1 shown in Figures 1-3 comprises a long arm 2 and a short arm 3 both arms projecting from a head portion 4. The long and short arm 2,3 may be similar to those described in WO 02/39451. As shown in Figure 4, the long arm 2 is designed to be inserted through an aperture or slot 5 in a side wall 6 of a base portion of a DVD container. Preferably, it extends across the base portion 7 and interacts with disk-holding means 8 on the base portion 7 to lock the disk (not shown) onto the base portion 7 as described in WO 02/39451. As shown in Figure 5, the short arm 3 is designed to be inserted through an aperture or slot 9 in a side wall of a lid portion 10 of the container which is hingedly attached to the base portion 7 along an edge thereof so as to hold the lid portion 10 in a closed position relative to the base portion.

The arms 2, 3 and the head portion 4 are preferably formed of a plastics material.

The long arm 2 is provided with a releasable locking mechanism which, once the long arm has been inserted into the container, locks the device to the container until it is released therefrom, e.g. by a magnetic release apparatus, such as may be provided behind the counter in a retail outlet. In the embodiment shown in Figure 5, the locking mechanism comprises a metal pivot arm 11 which, once the security tag 1 has been inserted into the container, engages a detent 12 within the base portion 7 so providing a snap-fit which prevents withdrawal of the security device 1 from the container until the pivot arm 11 is moved, e.g. by a magnetic release device or a specially shaped key, out of engagement with the detent 12 (the metal pivot arm 11 is not shown in Figs 1-3). This and other locking mechanisms are described further in WO 02/039451. The locking mechanism is preferably arranged to be capable of repeated locking and unlocking so the device can be re-used many times.

The security device described in WO02/39451 holds an AM flatstrip type security tag within a recess towards the distal end of the long arm 2 thereof. In contrast, the security device illustrated in Figures 1-5 has a non-planar RF type security tag in the form of a coil 13 wound around a magnetic core 14, e.g. a ferrite rod, mounted within the head portion 4. The coil 13 is connected to a capacitor (not shown) located adjacent thereto. WO 02/39451 discloses a head portion which is essentially planar and which has a metal plate therein to assist in withdrawal of the security tag from the container by magnetic means once the locking mechanism securing it within the container has been released. In contrast, the security device described herein comprises an enlarged head portion 4 which is shaped to accommodate the ferrite rod 14 with a coil 13 wound thereabout. The ferrite rod 14 typically has a length in the range 15-20mm and a diameter (including the coil) of around 5-10mm.

This ferrite rod 14 and coil 13 act as a transponder for receiving a radio frequency signal from an alarm unit and transmitting a signal back to the alarm unit. By mounting the transponder externally of the container it is well positioned to communicate with the alarm unit. In particular, when mounted in the position shown adjacent a narrow edge of the container, it is located substantially within the plane occupied by a CD or DVD (or other contents of the container) held within the container. The transponder is thus located substantially co-planar with the metal layer within the CD or DVD (or other contents of the container) so is not shielded by the metal layer whatever the orientation of the container relative to the alarm unit.

Furthermore, the transponder is located remote from the contents of the container. As the transponder include a magnetic member this may be desirable to avoid damaging the contents of the container if they are susceptible to magnetic fields.

Mounting the transponder externally also avoids occupying space within the container so it does not interfere with the contents or reduce the volume available for housing contents within the container.

The security device can also be installed in the container when the latter is in a closed configuration.

The enlarged head portion 4 projects from the container and thus increases its external dimension but only in a localised area along the opening side of the container so has a negligible effect upon the storage or shelving requirements for displaying the product within a retail outlet. The head portion 4 is also preferably mounted within a finger recess 15 provided along the opening edge of the container to reduce the distance by which it projects beyond the external dimensions of the container.



In other arrangements, the transponder may be mounted externally in other locations on the container or mounted adjacent an external wall of the container. In the latter case, it may be housed within the container and/or so that it does not project beyond the external dimensions thereof. An example of this is described further below with reference to Figure 6.

The arrangement shown in figures 1-5 has a further significant advantage in that the ferrite rod 14 performs two functions. First, it forms part of the RF transponder and, secondly, as it is magnetic, it can be used to assist in withdrawal of the security device from the container by magnetic means so performs the role of the metal plate provided in the head portion 4 such as described in WO 02/39451. As ferrite is less strongly attracted by a magnetic force than a metal insert, to enable reliable functioning of the release apparatus in withdrawing the device from a container, the type of ferrite used preferably has high ferromagnetic properties and it is preferably located as close as possible to the outermost facing surface of the head 4. If the security device is intended to be re-used, the ferrite rod 14 is also preferably magnetically saturated so that it retains its magnetism and is not deactivated in the presence of a magnetic field.

There are various ways of mounting the ferrite transponder in the head portion 4 of the security device. In a preferred method, the head portion comprises a cover 16 which fits onto the security device to locate the transponder and hold it in place within the head portion 4. The cover 16 is preferably a snap-fit onto the device so that once it is located in place it cannot be removed without breaking open the head portion 4 or by the application of a specialised release tool or key. Preferably, the outer wall of the cover 16 is thin, e.g. 1mm or less or 0.5mm or less in thickness, so the ferrite rod 14 is located as close as possible to the external surface thereof to maximise the magnetic force applied thereto when the head 4 is brought up to a magnet in the release apparatus.

Figures 2 and 3 show a cover 16 having four projecting arms 16A, 16B, 16C and 16D which snap-fit into sockets or recesses (not shown) provided in the head portion 4 of the security device. The cover 16 and the outer end 4A of the head portion 4 are shaped to locate the cylindrical ferrite rod and secure it within the head portion 4. In the arrangement shown, the ends 14A and 14B of the ferrite rod 14 are exposed on each side of the head portion 4 to enable the length of the rod to be maximised within the limited space available. In other embodiments, the ferrite rod 14 may be completely concealed within the head portion 4.

The head portion 4 is preferably shaped so as to make it difficult to obtain a purchase thereon to try to pull the security tag out of the container without authorised release of the locking mechanism. To this end, it preferably has a curved outer surface as shown which, in use, faces outward from the container. This curved form also helps minimise the amount of plastic shielding the ferrite rod 14 from a magnetic field applied thereto when magnetic release apparatus is used to withdraw the device from the container. In another embodiment (not shown) the ends of the head portion 4 adjacent the ends of the ferrite rod 14 may also have a curved form for the same reason.

RF security tags may be designed to be deactivated by a deactivation unit behind the counter in a retail outlet in which case there is no need to remove the security tag from the container when a customer purchases the container. In this case, the security tag may be designed for a single use only and disposed of by the customer.

Other types of security tags can be deactivated and then reactivated so they can be re-used. In this case, the retail outlet may deactivate the tag and then remove it before the customer takes the container away.

However, the preferred form of RF security tag for use with the arrangement described herein is a permanent form which cannot be deactivated as this

increases the level of security provided by the tag. In this case, the tag must be removed from the container prior to the customer taking the container out of the store. As such security tags are designed for multiple re-use, there are less cost restraints on its design so higher quality components may be used.

The RF security tag can be arranged to send an identification signal or other data to the alarm unit but a signal simply indicating its presence is sufficient to trigger an alarm.

Magnetic release apparatus for releasing a security device such as that described herein is described in WO 02/39451 so will not be described further herein.

Whilst such magnetic locking and release devices are preferred, other embodiments may use other types of locking devices including mechanical locks and mechanical release means or keys.

The use of an RF tag having a ferrite rod is preferred as described above but other non-planar forms of transmitting and/or receiving means may be used in the positions described above.

The container with which the security device is used may typically be provided with an outer wrapping, e.g. a plastic shrink-wrapping. The security tag 1 is designed to pierce such a wrapping so the security device can be installed after application of the wrapping. The long and short arms 2 and 3 thus preferably have pointed ends 2A, 3A or are shaped so as to easily pierce such a wrapping. As the arms 2 and 3 are relatively thin and as the area in which they pierce the wrapping is, in use, concealed by the head portion 4 of the device, this does not prejudice the integrity of the wrapper nor its appearance and the shrink-wrapping remains intact. It thus still provides tamper evidence and provides reassurance to the customer that the contents have not been interfered with.

The arrangement described above thus enables a non-planar form of security tag, such as an RF device with a cylindrical core, to be used in relation to a container in a manner which avoids, or significantly reduces, the problem of shielding, is small enough to be mounted on a security device which is used to inhibit removal of a product from the container, e.g. a security device such as that described in WO 02/39451, without compromising the level of security provided by this device, yet whose performance is sufficient to provide reliable operation in triggering an alarm.

The arrangement described also has the advantage that it can still be used with existing release apparatus used to release a security device from the container, e.g. release apparatus such as that described in WO 02/39451. Moreover, a component of the security tag, e.g. a ferrite rod, is used both as part of the transponder and to assist in withdrawal of the security device from the container by magnetic release apparatus.

The arrangement thus provides a practical way of using an RF-type EAS device in relation to security devices of the type described in WO 02/39451 so they can be used in retail outlets employing RF alarm systems as well as those using AM alarm systems. The security device may, if desired, be arranged to receive both an AM tag and an RF tag. The required form of tag can then be mounted thereon, or even both types if desired.

Figures 6 and 7 illustrate another way of mounting an RF transponder 20 on a security device 2 of the type described in WO02/39451. This embodiment is based upon the realisation that another way to avoid, or reduce, the problem of shielding caused by the metal layer within a disk 21 such as a CD or DVD (see Figure 8) is to mount the RF transponder 20 in a position which is aligned with the central region of the disk 21. Such disks have an aperture 21A in the centre thereof typically of a diameter of 15mm. Thus, a transponder 20 located in the vicinity of the aperture in such a disk (and preferably close to the plane of the disk) will be able to receive and send signals in most directions as such signals

can pass through the aperture 21A in the disk so it can communicate with an alarm system located on either side of the disk 21. Furthermore, many such disks have a region 11B around the central aperture 21A which is not provided with a metal layer 21C. Thus, the aperture in the metal layer 21C of a disk is often greater than the aperture 21A in the plastic layers between which the metal layer 21C is sandwiched. The diameter of this substantially metal free area 21B may be up to 38mm in diameter but, more typically, is around 30mm in diameter. There is, therefore, window of appreciable size in the centre of the disk 21 through which signals can be received by and sent from an RF transponder 20 located in that vicinity.

As indicated above, it is also highly desirable for the RF transponder 20 to be carried by the security device 2 so that it can be locked within the container and once removed can be re-used in another container. In this embodiment, the RF transponder 20 is thus mounted on the security device 2 in a position such that, in use, when the security device 2 is installed within the container 7, it lies in the vicinity of the window described above in the metal layer 21C of the disk 21.

The security device 2 typically has a width similar to the diameter of the central hole 21A of the disk. Thus, a transponder 20 with a width of 15mm and a length of 15 to 30 mm can be mounted on the long arm of the security device 2 in a position such that, when installed, it lies under the central area of the disk 21. This means that it also lies under the disk-holding means 8 but as this is typically formed of plastic, it is transparent to the RF signals.

An RF transponder 20 of the above dimension can be provided either in the form of a flat coil of wire (or other electrical conductors) similar to that described above but wound in elongate loops rather in circles so as to fit within a 15 x 30mm area on the security device 2 or in the form of a coil wound around a thin, substantially flat, ferrite core.

Figure 8 shows a cross-section on line A-A of Figure 7 through the disk holding means 8, a disk 21 held thereon and a security device 2 located under the disk holding means 8 with an RF transponder 20 mounted thereon so as to be located adjacent the disk 21 and in the vicinity of the central aperture 21A of the disk. Figure 8 also shows the typical extent of a metal layer 21C embedded within the disk 21.

Figure 9 shows a similar cross-section through another form of disk holding means 8' which provides more space between the above the security device 2 in the vicinity of the central hole 21A of the disk 21 and which would thus enable the invention to be implemented with an RF transponder 20' of slightly greater thickness (perpendicular to the plane of the disk) although, in cases where the security device 2 is inserted through a slot in the extended wall of the container (e.g. slot 5 shown in Figure 6), this would require the slot to be made slightly larger too.

A similar arrangement can be used in apparatus designed to hold other articles which have a tendency to shield electromagnetic radiation. In some cases, the container may be adapted to hold two or more such articles, e.g. side by side, in which case the security device is arranged so that the RF transponder lies in the vicinity of a gap between the articles.

The arrangements described in relation to Figures 6-9 have the additional advantage in that the head of the security device need not protrude beyond the external walls of the container as the transponder is mounted within the container.

CLAIMS

1. A security device for attachment to a container having external walls such that at least a signal receiving and/or transmitting portion thereof is located externally of or adjacent to one of said external walls, the security device being arranged to trigger an alarm signal if the container is moved within the range of an alarm unit with the security device attached thereto, the security device having a releasable locking mechanism to secure it to the container such that release of the locking mechanism requires the use of authorised release means.
2. A security device as claimed in claim 1 having a first arm for insertion within a first aperture in the container.
3. A security device as claimed in claim 2 comprising a head portion from which said first arm projects, said signal receiving and/or transmitting portion being located in the head portion.
4. A security device as claimed in claim 4 in which said first arm is a snap-fit within the container.
5. A security device as claimed in any preceding claim in which the locking mechanism is releasable magnetically.
6. A security device as claimed in any of claims 2-5 having a second arm for insertion within a second aperture in the container.
7. A security device as claimed in claim 6 arranged such that the first arm fits within an aperture in a base portion of the container and the second arm fits within an aperture in a lid portion of the container, or vice versa.

8. A security device as claimed in any of claims 2-7 in which the container comprises a base portion and a lid portion the lid portion being hingedly connected to the base portion along a first edge thereof, the first arm being arranged to fit within said first aperture which is provided in an opening edge of the container opposite said first edge.
9. A security device as claimed in any preceding claim for attachment to a container having holding means for holding a disk via a central aperture thereof and which is arranged to interact with the holding means so as to lock the disk thereon.
10. A security device as claimed in any preceding claim comprising a magnetic component arranged both as part of the signal receiving and/or transmitting portion and to assist in removal of the device from the container by magnetic release means.
11. A security device as claimed in any preceding claim in which the signal receiving and/or transmitting portion thereof comprises an RF transponder.
12. A security device as claimed in claim 11 in which the RF transponder comprises a magnetic core with a coil wound therearound.
13. A security device as claimed in claim 12 in which the magnetic core is formed of ferrite.
14. A security device as claimed in claim 11, 12 or 13 having a cover portion which holds the transponder in the device.
15. A security device as claimed in claim 14 in which the cover portion is held in place by a snap-fit.



16. A security device as claimed in any of claims 11-15 when dependent upon claim 3 in which the transponder is located within said head portion.
17. A security device as claimed in claim 16 in which said head portion has a curved external surface which, in use, faces outward from the container.
18. A security device as claimed in any preceding claim in combination with a container, the security device being located externally of the container adjacent an external wall of the container.
19. A security device as claimed in claim 18 in which the container has a recess within said external wall, the security device being at least partially located within said recess.
20. A security device as claimed in claim 18 or 19 in which the container is adapted to hold a substantially planar article, the article including a metal layer wherein the security device is located in a position substantially co-planar with said metal layer.
21. A security device as claimed in claims 1 and 2 in which the signal receiving and/or transmitting portion thereof is located in a position along said first arm such that, in use, it lies adjacent an article held in the container in the vicinity of a window or aperture in a metal layer of the article.
22. A security device as claimed in claim 21 in which the article is a disk having a central aperture and the signal receiving and/or transmitting portion is arranged, in use, to be positioned in the vicinity of said aperture.
23. A security device for attachment to apparatus adapted to hold one or more articles which includes a layer which is non-transparent to electromagnetic radiation, the security device having a portion for receiving and/or

transmitting electromagnetic radiation so as to trigger an alarm signal if the apparatus is moved within the range of an alarm unit with the security device attached thereto, said portion being located on the device such that it lies in the vicinity of a window in said layer or a gap between two such layers so as to be able to receive and/or transmit electromagnetic radiation through said window or gap when the device is attached to said apparatus.

24. A security device as claimed in claim 23 for attachment to apparatus adapted to hold a disk having a central aperture, said portion being located such that, in use, it lies adjacent the disk in the vicinity of the central aperture thereof.
25. A security device as claimed in claim 23 or 24 in which said portion comprises a flat coil of electrical conductors wound in elongate loops.
26. A security device as claimed in claim 23 or 24 in which said portion comprises a coil wound around a substantially flat ferrite core.
27. A security device substantially as hereinbefore described with reference to and/or as shown in one or more of the accompanying drawings.
28. A security device in combination with a container or apparatus substantially as hereinbefore described with reference to and/or as shown in one or more of the accompanying drawings.
29. A device adapted to hold signal receiving and/or transmitting means such that, when said signal and/or receiving means is mounted thereon, a security device as claimed any preceding claim is provided.

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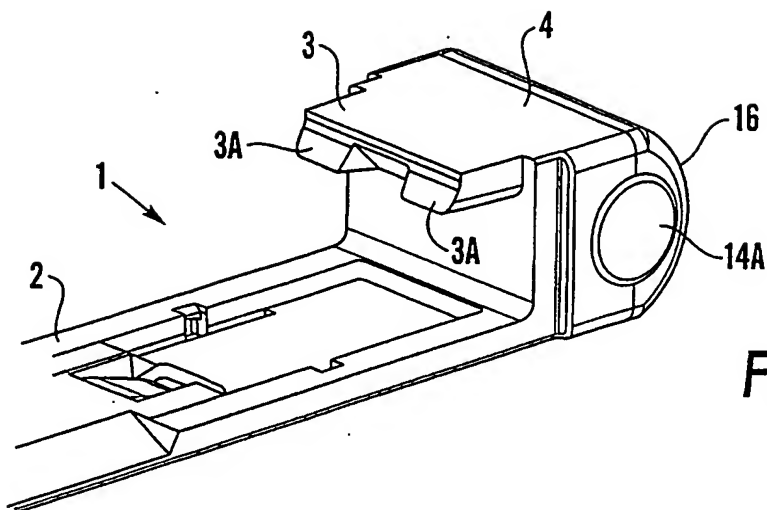


Fig. 1

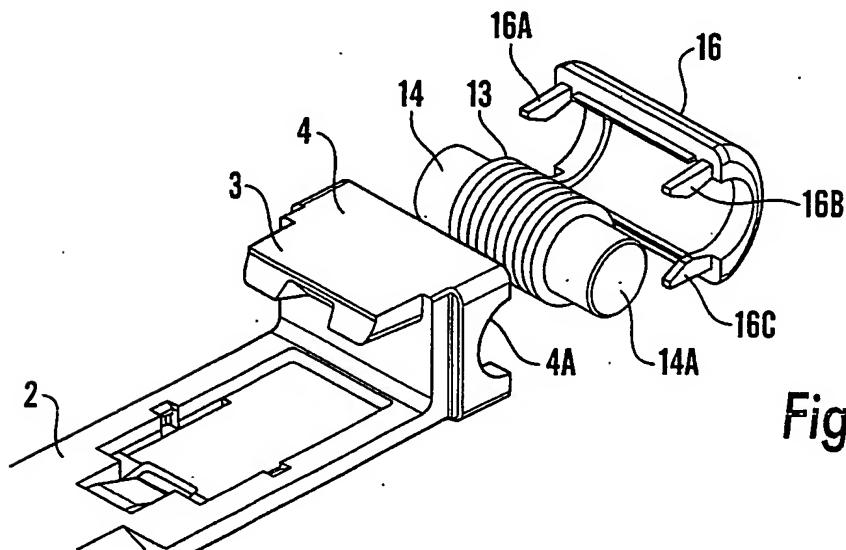


Fig. 2

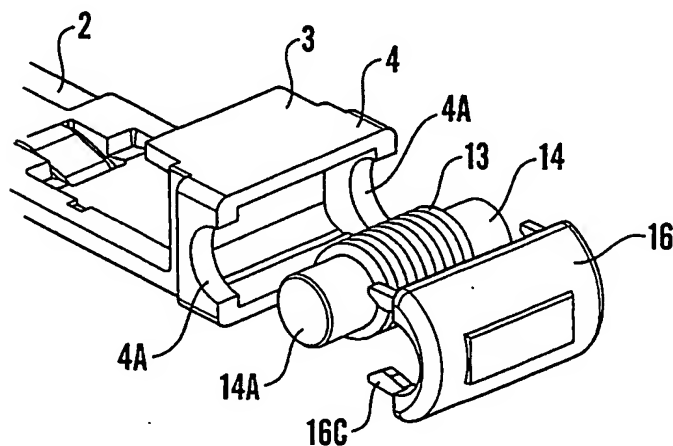


Fig. 3

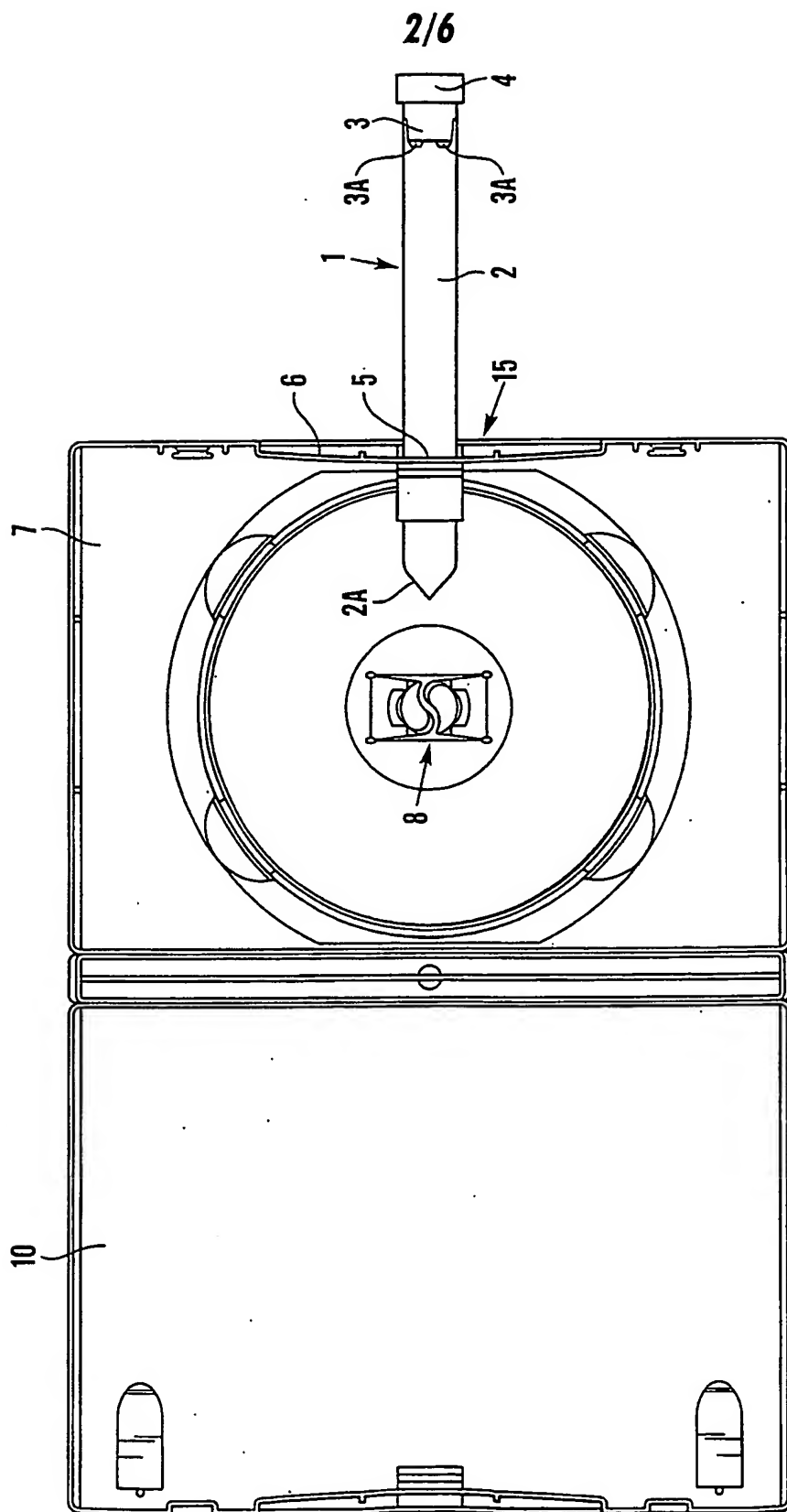


Fig.4

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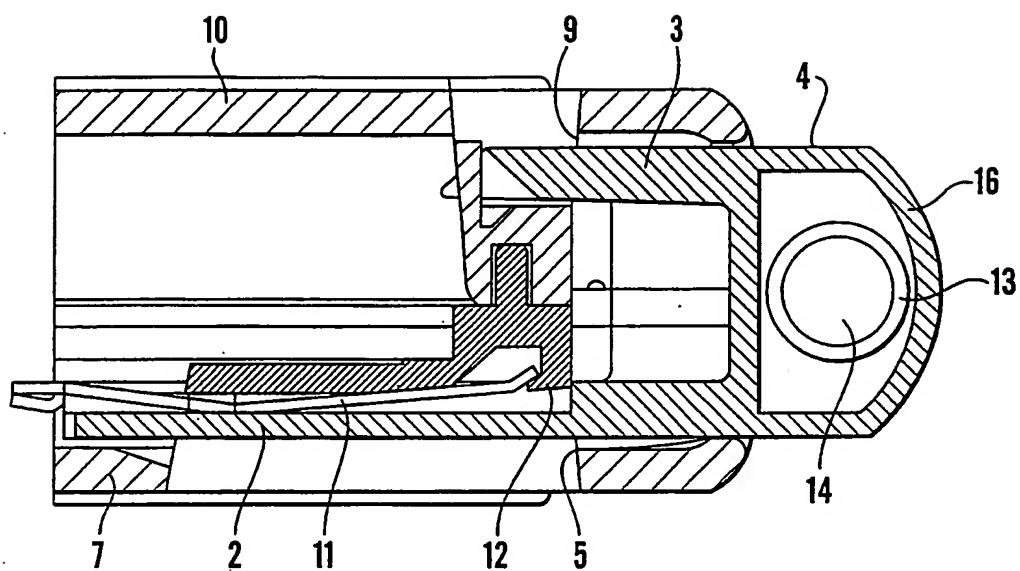


Fig.5

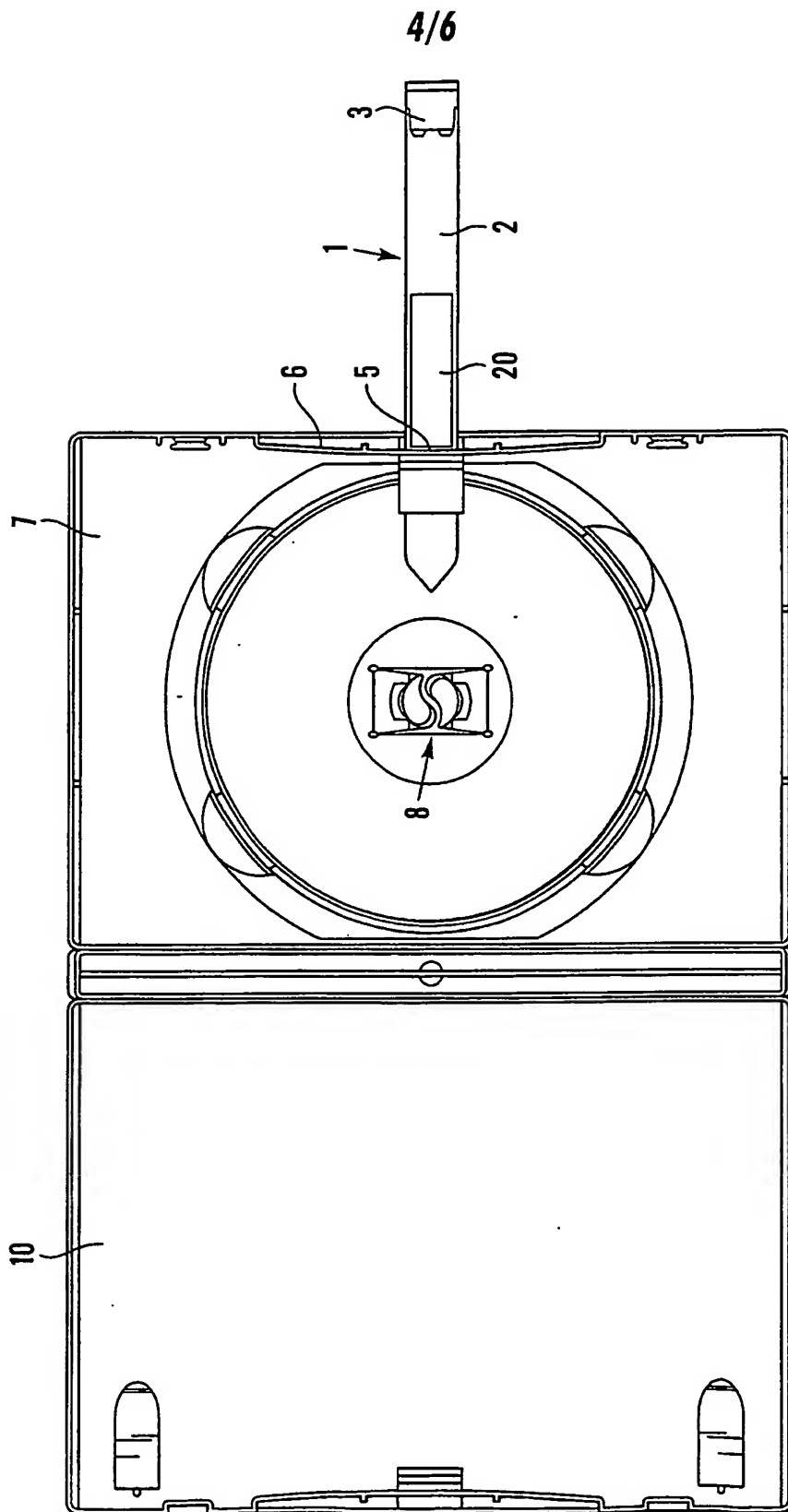


Fig.6

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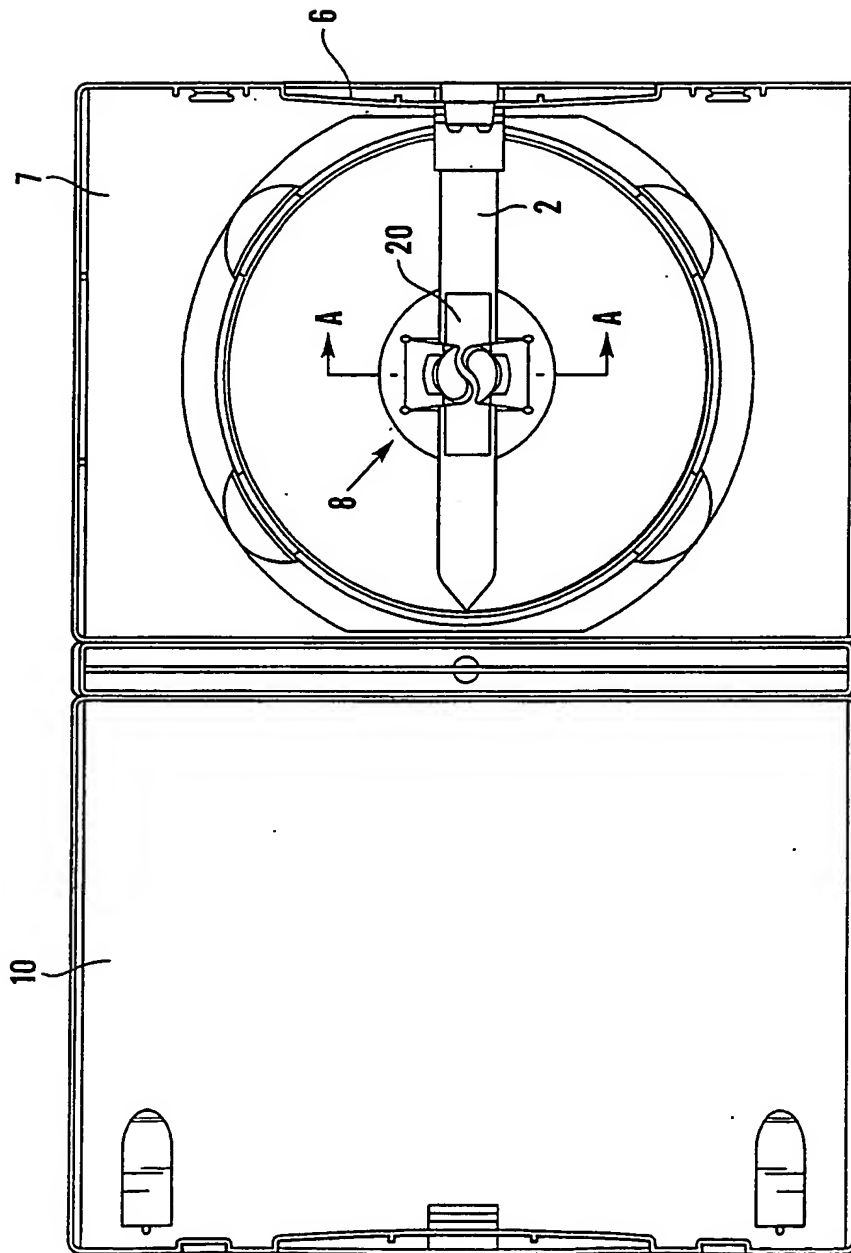


Fig.7

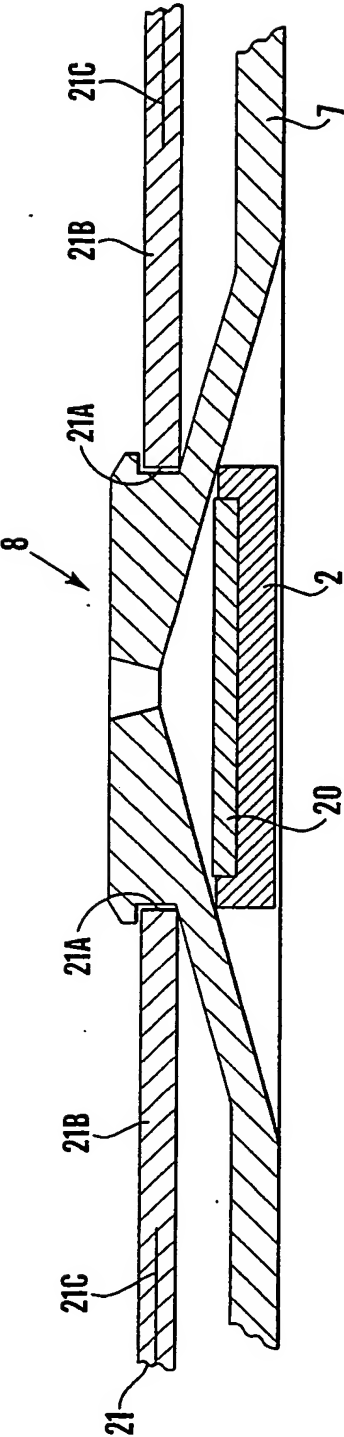


Fig. 8

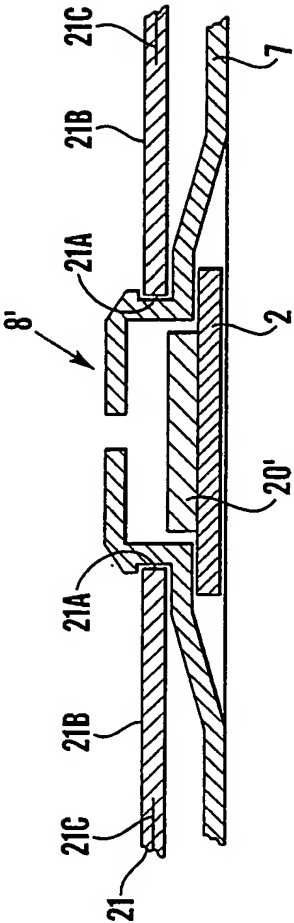


Fig. 9



## INTERNATIONAL SEARCH REPORT

Int. Application No.

PCT/GB 03/02885

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 E05B73/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 E05B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 2 369 348 A (DUBOIS LTD) 29 May 2002 (2002-05-29) page 8, line 20 - line 26 page 9, line 5 - line 13 page 11, line 5 - line 16; figure ---	1-11, 16, 18-24, 29
X	US 4 709 813 A (WILDT THEODOR N) 1 December 1987 (1987-12-01) column 2, line 61 - column 3, line 15; figures 1, 2 ---	1, 18-20, 22-24, 29
X	FR 2 621 893 A (WEILL BERNARD) 21 April 1989 (1989-04-21) page 4, line 12 - line 30; figure 1 ---	22, 23, 29
	--- -/--	

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

## \* Special categories of cited documents:

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Date of the actual completion of the international search

31 October 2003

Date of mailing of the international search report

07/11/2003

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Pieracci, A

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 03/02885

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>WO 02 42587 A (AUTRONIC PLASTICS INC)  30 May 2002 (2002-05-30)</p> <p>page 11, line 2 - line 3  page 9, line 25 - line 28; figures 11,12  -----</p>	<p>1,2,5,  9-11,21,  29</p>

## INTERNATIONAL SEARCH REPORT

Intern Application No

PCT/GB 03/02885

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
GB 2369348	A	29-05-2002	AU 1414602 A	21-05-2002
			CA 2427634 A1	16-05-2002
			EP 1336177 A2	20-08-2003
			WO 0239451 A2	16-05-2002
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			CA 2417200 A1	30-05-2002
			EP 1307627 A2	07-05-2003
			WO 0242587 A2	30-05-2002

Box No. VIII (iv) **DECLARATION: INVENTORSHIP** (only for the purposes of the designation of the United States of America)  
*The declaration must conform to the following standardized wording provided for in Section 214; see Notes to Boxes Nos. VIII, VIII (i) to (v) (in general), and the specific Notes to Box No. VIII (iv): If this Box is not used, this sheet should not be included in the request.*

**Declaration of Inventorship (Rules 4.17(iv) and 51bis.1(a)(iv))  
for the purposes of the designation of the United States of America:**

I hereby declare that I believe I am the original, first and sole (if only one inventor is listed below) or joint (if more than one inventor is listed below) inventor of the subject matter which is claimed and for which a patent is sought.

This declaration is directed to the international application of which it forms a part (if filing declaration with application).

This declaration is directed to international application No. PCT/GB 2003/002,885 (if furnishing declaration pursuant to Rule 26ter).

I hereby declare that my residence, mailing address, and citizenship are as stated next to my name.

I hereby state that I have reviewed and understand the contents of the above-identified international application, including the claims of said application. I have identified in the request of said application, in compliance with PCT Rule 4.10, any claim to foreign priority, and I have identified below, under the heading "Prior Applications," by application number, country or Member of the World Trade Organization, day, month and year of filing, any application for a patent or inventor's certificate filed in a country other than the United States of America, including any PCT international application designating at least one country other than the United States of America, having a filing date before that of the application on which foreign priority is claimed.

Prior Applications: GB0215397.1 - filed 4 July 2002

I hereby acknowledge the duty to disclose information that is known by me to be material to patentability as defined by 37 C.F.R. § 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the PCT international filing date of the continuation-in-part application.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

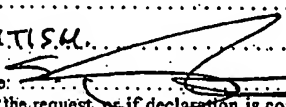
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☒ This declaration is continued on the following sheet, "Continuation of Box No. VIII (iv)".

Continuation of Box No. VIII (i) to (v) **DECLARATION**

*If the space is insufficient in any of Boxes Nos. VIII (i) to (v) to furnish all the information, including in the case where more than two inventors are to be named in Box No. VIII (iv), in such case, write "Continuation of Box No. VIII..." (indicate the item number of the Box) and furnish the information in the same manner as required for the purposes of the Box in which the space was insufficient. If additional space is needed in respect of two or more declarations, a separate continuation box must be used for each such declaration. If this Box is not used, this sheet should not be included in the request.*

[Include if more than 2 US inventors & mark box on page 6]


VIII (iv) continued...

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(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
15 January 2004 (15.01.2004)

PCT

(10) International Publication Number  
**WO 2004/005654 A1**

(51) International Patent Classification<sup>7</sup>: **E05B 73/00**

Leeds, LS29 6EX (GB). FRASER, Anthony, Henry, Joseph [GB/GB]; The Priory, Ketton, Rutland PE9 3RD (GB). JOHNSTON, Robert [GB/GB]; 19 Briary Close, Great Oakley, Corby, Northants NN18 8JG (GB).

(21) International Application Number:  
PCT/GB2003/002885

(22) International Filing Date: 4 July 2003 (04.07.2003)

(74) Agents: UNWIN, Stephen Geoffrey, et al.; Fry Heath & Spence LLP, The Gables, Massetts Road, Horley, Surrey RH6 7DQ (GB).

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
0215397.1 4 July 2002 (04.07.2002) GB

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

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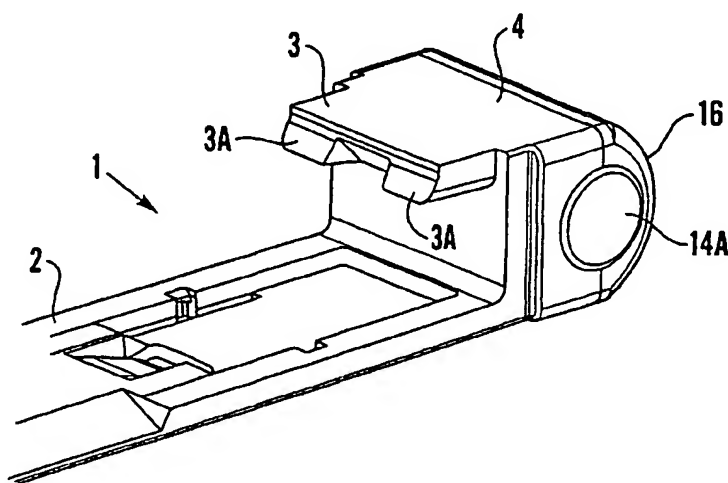
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(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,

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[Continued on next page]

(54) Title: SECURITY DEVICE



(57) Abstract: A security device (2) for attachment to a container (7,10) having external walls such that a transponder (20) thereon is located externally of or adjacent to one of said external walls so as to avoid being shielded by a metal layer (21) within the container (7, 10) (e.g. the metal layer within a disk such as a CD or DVD). The security device (2) is arranged to trigger an alarm signal if the container (7, 10) is moved within the range of an alarm unit with the security device (2) attached thereto, and has a releasable locking mechanism (11, 12) to secure it to the container (7,10) such that release of the locking mechanism (11, 12) requires the use of authorised release means. In one embodiment the transponder (20) is located in the vicinity of a window (21A) in a metal layer (21), e.g. at the centre of the disk.

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CLAIMS

1. A security device for attachment to a container having external walls such that at least a signal receiving and/or transmitting portion thereof is located externally of or adjacent to one of said external walls, the security device being arranged to trigger an alarm signal if the container is moved within the range of an alarm unit with the security device attached thereto, the security device having a releasable locking mechanism to secure it to the container such that release of the locking mechanism requires the use of authorised release means, the security device comprising a magnetic component arranged both as part of the signal receiving and/or transmitting portion and to assist in removal of the device from the container by magnetic release means.
2. A security device as claimed in claim 1 having a first arm for insertion within a first aperture in the container.
3. A security device as claimed in claim 2 comprising a head portion from which said first arm projects, said signal receiving and/or transmitting portion being located in the head portion.
4. A security device as claimed in claim 4 in which said first arm is a snap-fit within the container.
5. A security device as claimed in any preceding claim in which the locking mechanism is releasable magnetically.
6. A security device as claimed in any of claims 2-5 having a second arm for insertion within a second aperture in the container.



7. A security device as claimed in claim 6 arranged such that the first arm fits within an aperture in a base portion of the container and the second arm fits within an aperture in a lid portion of the container, or vice versa.
8. A security device as claimed in any of claims 2-7 in which the container comprises a base portion and a lid portion the lid portion being hingedly connected to the base portion along a first edge thereof, the first arm being arranged to fit within said first aperture which is provided in an opening edge of the container opposite said first edge.
9. A security device as claimed in any preceding claim for attachment to a container having holding means for holding a disk via a central aperture thereof and which is arranged to interact with the holding means so as to lock the disk thereon.
10. A security device as claimed in any preceding claim in which the magnetic component is a solid, cylindrical rod.
11. A security device as claimed in any preceding claim in which the signal receiving and/or transmitting portion thereof comprises an RF transponder.
12. A security device as claimed in claim 11 in which the RF transponder comprises a magnetic core with a coil wound therearound.
13. A security device as claimed in claim 12 in which the magnetic core is formed of ferrite.
14. A security device as claimed in claim 11, 12 or 13 having a cover portion which holds the transponder in the device.
15. A security device as claimed in claim 14 in which the cover portion is held in place by a snap-fit.

16. A security device as claimed in any of claims 11-15 when dependent upon claim 3 in which the transponder is located within said head portion.
17. A security device as claimed in claim 16 in which said head portion has a curved external surface which, in use, faces outward from the container.
18. A security device as claimed in any preceding claim in combination with a container, the security device being located externally of the container adjacent an external wall of the container.
19. A security device as claimed in claim 18 in which the container has a recess within said external wall, the security device being at least partially located within said recess.
20. A security device as claimed in claim 18 or 19 in which the container is adapted to hold a substantially planar article, the article including a metal layer wherein the security device is located in a position substantially co-planar with said metal layer.
21. A security device as claimed in claims 1 and 2 in which the signal receiving and/or transmitting portion thereof is located in a position along said first arm such that, in use, it lies adjacent an article held in the container in the vicinity of a window or aperture in a metal layer of the article.
22. A security device as claimed in claim 21 in which the article is a disk having a central aperture and the signal receiving and/or transmitting portion is arranged, in use, to be positioned in the vicinity of said aperture.
23. A security device for attachment to apparatus adapted to hold one or more articles which include a layer which is non-transparent to electromagnetic

radiation, the security device having a portion for receiving and/or transmitting electromagnetic radiation so as to trigger an alarm signal if the apparatus is moved within the range of an alarm unit with the security device attached thereto, said portion being located on the device such that it lies in the vicinity of a window in said layer or a gap between two such layers so as to be able to receive and/or transmit electromagnetic radiation through said window or gap when the device is attached to said apparatus.

24. A security device as claimed in claim 23 for attachment to apparatus adapted to hold a disk having a central aperture, said portion being located such that, in use, it lies adjacent the disk in the vicinity of the central aperture thereof.
25. A security device as claimed in claim 23 or 24 in which said portion comprises a flat coil of electrical conductors wound in elongate loops.
26. A security device as claimed in claim 23 or 24 in which said portion comprises a coil wound around a substantially flat ferrite core.
27. A security device substantially as hereinbefore described with reference to and/or as shown in one or more of the accompanying drawings.
28. A security device in combination with a container or apparatus substantially as hereinbefore described with reference to and/or as shown in one or more of the accompanying drawings.
29. A device adapted to hold signal receiving and/or transmitting means such that, when said signal and/or receiving means is mounted thereon, a security device as claimed in any preceding claim is provided.

**STATEMENT UNDER ARTICLE 19 (1)**

Claim 1 has been restricted to the features of former claim 10, i.e. that the security device includes a magnetic component (e.g. a ferrite rod 14 as described in relation to Figures 1-3) which is both part of the signal receiving and/or transmitting portion (e.g. part of an RF transponder) and arranged to assist in removal of the device from a container by magnetic release means (e.g. by being attracted by a magnet positioned adjacent the head 4 of the device during withdrawal of the device).

Amended claim 23 relates to the positioning of a portion for receiving and/or transmitting electromagnetic radiation (e.g. an RF transponder) in the vicinity of a window or gap in a layer which is non-transparent to such radiation (e.g. in the vicinity of the central aperture of a CD or DVD) so the said portion (e.g. RF transponder) is not shielded by said layer and can transmit/receive electromagnetic radiation through said window or gap.

The prior art discloses the location of a flat, AM type EAS tag in various locations within a CD box but does not disclose a security device as claimed in claim 1 or 23.